

colony. The Common Black carpenter ant (*Camponotus compressus*) is the most common prey, the next are termites, small beetles (largely *Protactia cuprea*) and caterpillars of moths and larvae of several insects. It was noted that cannibalism is also prevalent, injured or weak ants are caught and taken into the nest colony.

Its daily activity is paradoxical to normal practices of other animals. It begins to move out after sunrise and becomes more active with rising of temperature up to 50°C, whereas most of animals in the desert take shelter when temperature rises above 35°C and solar radiation above 40 cal/cm<sup>2</sup> hr. It is further noteworthy that it ceases to be active and goes underground when solar radiation is below 30 cal/cm<sup>2</sup> hr. In the winter it remains active during the mid-day when temperature

rises above 28°C or solar radiation above 40 cal/cm<sup>2</sup> hr.

It takes out excavated soil in wet pellet form and drop these out of the mouth of the nest as does other ants. Co-operation for dragging of a large sized prey was lacking.

It was noted that it dislikes rain and plugs the mouth of the nest with sand during rain. When accumulated water level rises to the mouth of the nest another opening is made at a higher level nearby and if necessary the nest colony is shifted to a nearby elevated site.

Its eggs and young were observed largely in the premonsoon season, i.e. late in June.

Babblers (*Turdoides caudatus* and *T. striatus*), crows (*Corvus splendens* and *C. macro-rhynchus*), *Calotes versicolor* and *Varanus* spp. etc. were observed preying on the carpenter ant.

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## 22. ACTIVITY AND ABUNDANCE OF FLOWER VISITING INSECTS OF ALMOND (*PRUNUS AMYGDALUS* BATSCH) AT LUDHIANA (PUNJAB)

Almond is an important fruit crop of hill regions of India. In the Punjab plains also this crop gave encouraging results at the almond orchard of the Punjab Agricultural University, Ludhiana. Due to this, the area under this crop is increasing in the Punjab. The almond flowers are 2.5 to 3.8 cm in diameter and have a single pistil with two ovules. The flower is self incompatible and, thus, the cross pollination of the flowers is a must for obtaining the almond crop. Secondly the pollen is also not wind blown, which leads to more dependence on insect pollinators.

Taking this in view, the flower visiting in-

sects of almond at the almond orchard of the Punjab Agricultural University at Ludhiana were recorded from 9.00 a.m. to 5.30 p.m. at hourly intervals. There were 5 replications and each tree served as one replication. The observations were recorded for 5 minutes on each tree. The observations were repeated thrice at weekly interval in March 1979, which was a peak flowering season of the year under study.

The honeybees, i.e. *Apis mellifera* Linn., *A. dorsata* Fabr. and *A. florea* Fabr. were the dominant flower visitors. The maximum population was that of *A. dorsata* (Table 1). Some dipterous flies also visited the flowers but their

TABLE 1

ACTIVITY AND ABUNDANCE OF FLOWER VISITING INSECTS OF ALMOND DURING MARCH, 1979

Name of species	9 h	10 h	11 h	12 h	13 h	14 h	15 h	16 h	17 h	Total
	Number of insects/5 trees at									
<i>Apis mellifera</i>	0	2	9	12	16	12	13	12	10	86
<i>Apis dorsata</i>	7	16	44	33	33	12	21	11	7	184
<i>Apis florea</i>	1	1	6	5	6	4	1	2	1	27
Total	8	19	59	50	55	28	35	25	18	297

number was negligible. In the earlier reports on almond pollination honeybees have been reported practically the only pollinating insects of economic importance (Muttoo 1950, Purdie and Winn 1965, McGregor 1976). The period of maximum activity of all the three species of honeybees was from 11.00 a.m. to 1.00 p.m. *A. dorsata* started visiting the flowers in sufficient numbers even at 9.00 a.m. than the other species of bees. *A. mellifera* was active even upto 5.00 p.m. The activity of all the flower visiting insects was very low on cloudy days.

In conclusion, honeybees were the only dominant flower visiting insects of almond at Ludhiana.

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23. BUTTERFLIES OF ARUNACHAL PRADESH

Altitudinal zones of the Eastern Himalayas have their own fauna. The ecosystem varies from west to east and the altitudinal zones are sharply defined and telescoped into tightly packed tiers of life zones. Considering the importance of North Eastern Himalaya as a gateway for oriental biota in the peninsula a

thorough ecological survey of the area is essential especially in the face of rapid man made environmental changes. One such expedition was organised jointly by the Bombay Natural History Society and the Smithsonian Institution, Washington D.C. for the avifaunal survey of the Arunachal Pradesh. During the survey